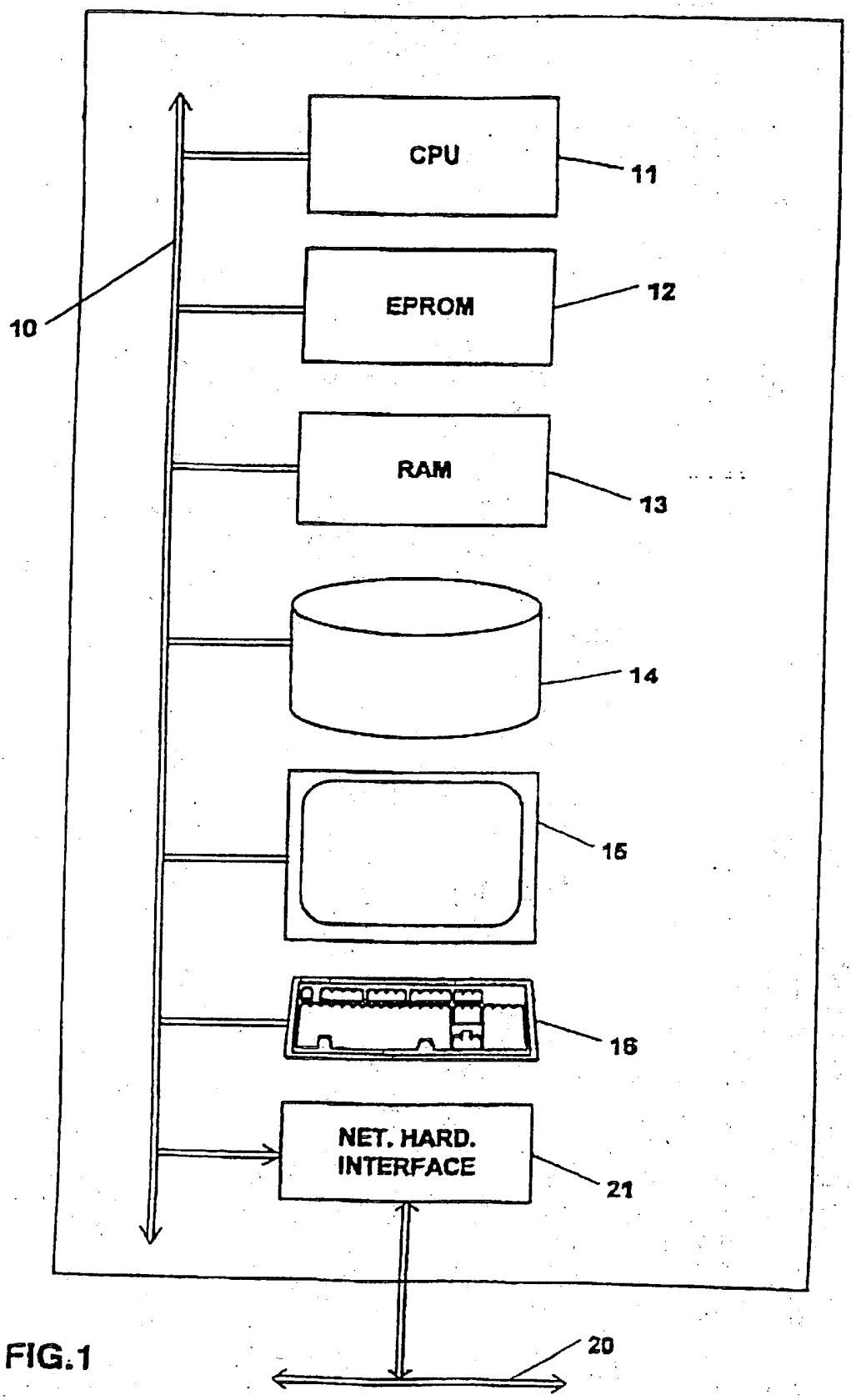

FIG.1

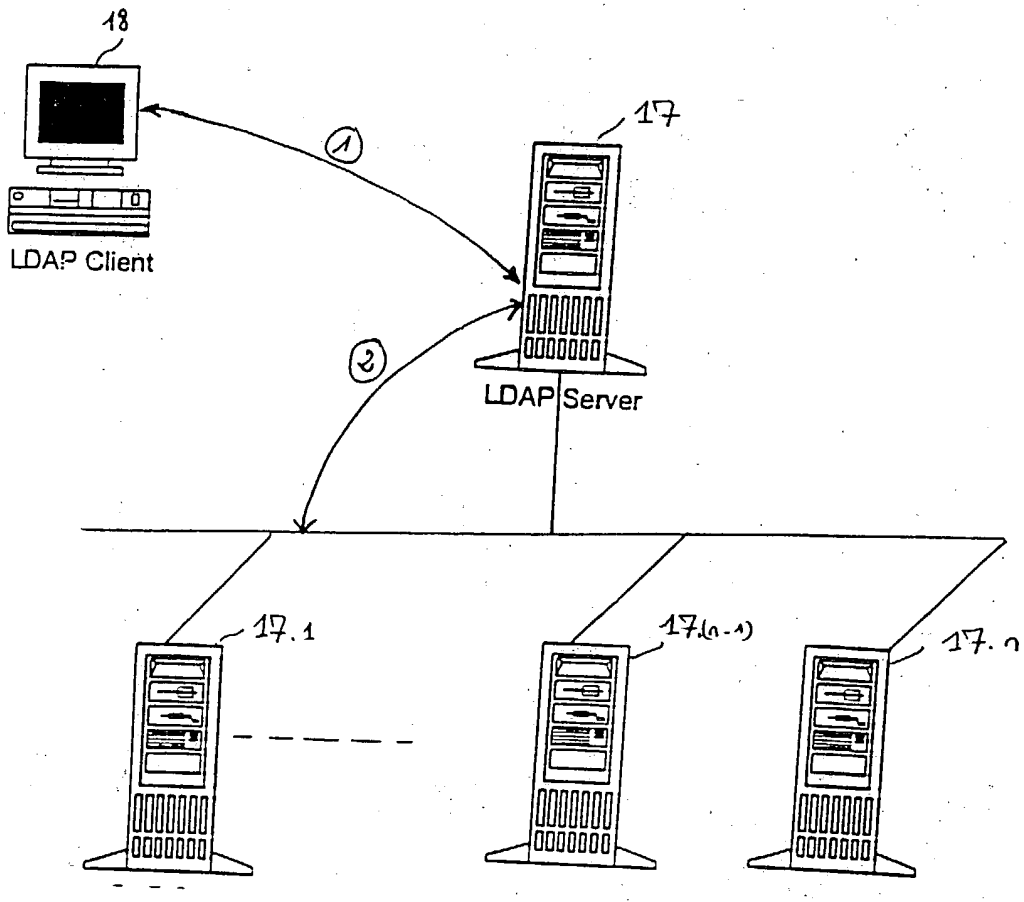

FIG. 2.

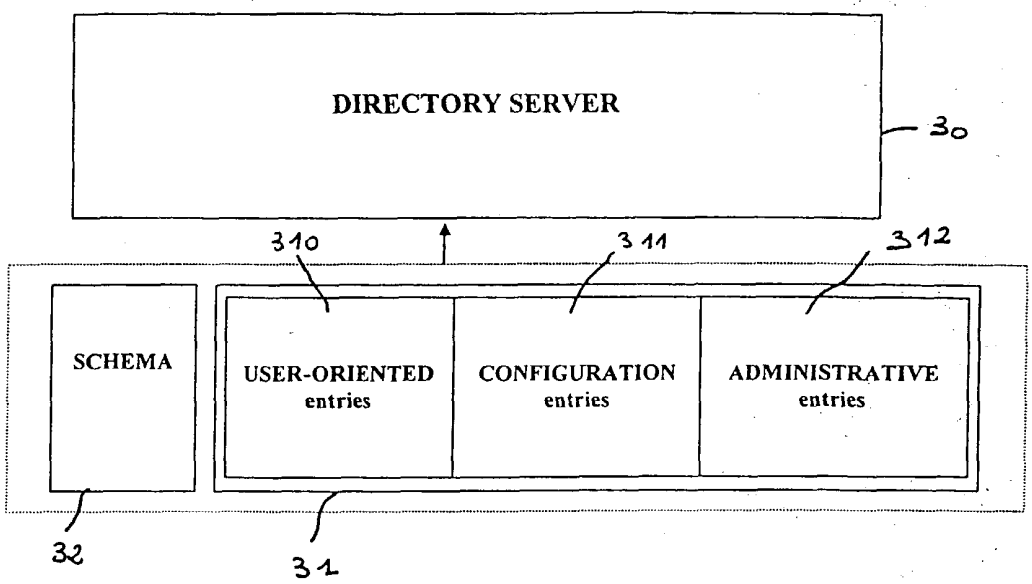
DIRECTORY SERVER
30
310
311
312
SCHEMA
USER-ORIENTED
entries
CONFIGURATION
entries
ADMINISTRATIVE
entries
32
31

FIG 3

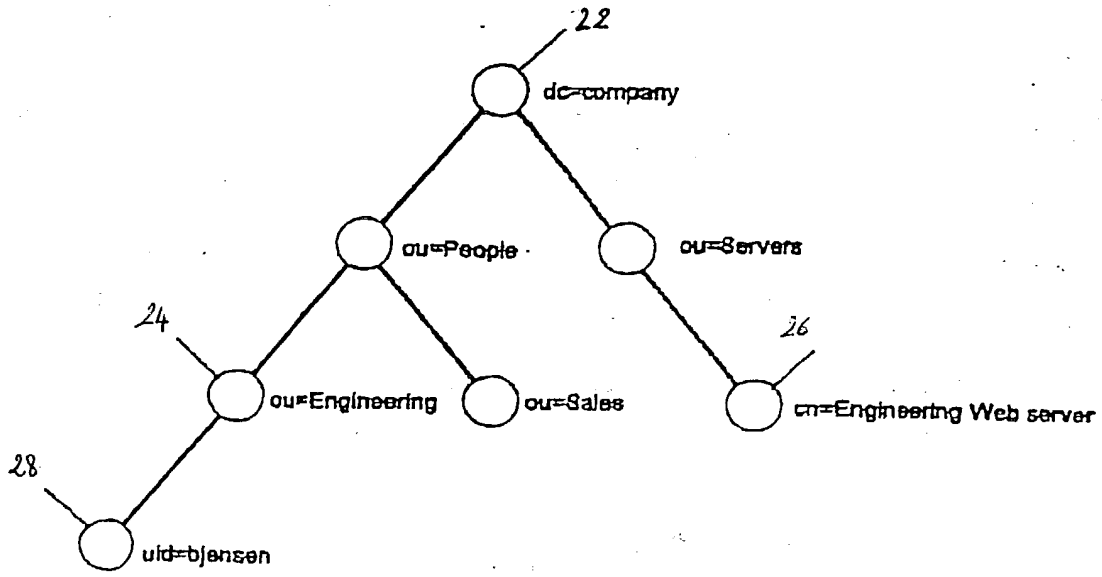
22
dc=company
ou=People
ou=Servers
24
26
ou=Engineering
ou=Sales
cn=Engineering Web server
28
uid=bjensen

FIG 4

Entry 404

Attribute type 400	Attribute value 402
dn :	uid=Joe, ou=people, dc=france, dc=sun, dc=com
objectClass :	top
objectClass :	person
objectClass :	organizationalPerson
objectClass :	inetOrgPerson
cn :	Joe
sn :	Rayan
uid :	joerayan
mail :	joerayan@sun.com
phoneNumber :	778

Fig 5

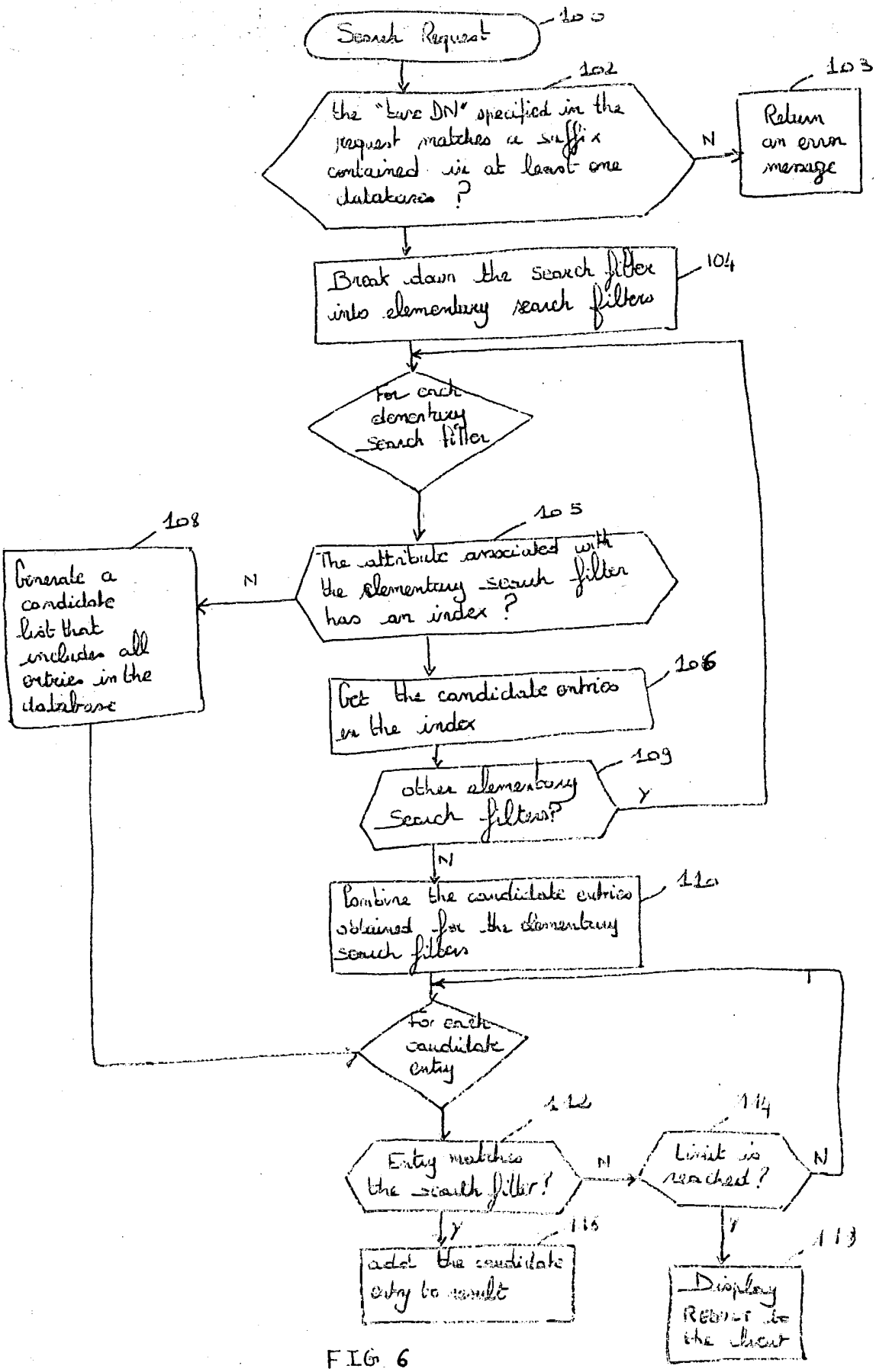
Search Request
100
The "base DN" specified in the request matches a suffix contained in at least one database ?
102
N
Return an error message
103
Break down the search filter into elementary search filters
104
For each elementary search filter
The attribute associated with the elementary search filter has an index ?
105
N
Generate a candidate list that includes all entries in the database
108
Get the candidate entries in the index
106
other elementary search filters?
109
Y
N
Combine the candidate entries obtained for the elementary search filters
110
For each candidate entry
Entry matches the search filter ?
112
N
Limit is reached ?
114
N
Y
add the candidate entry to result
116
Display Result to the client
113

FIG 6

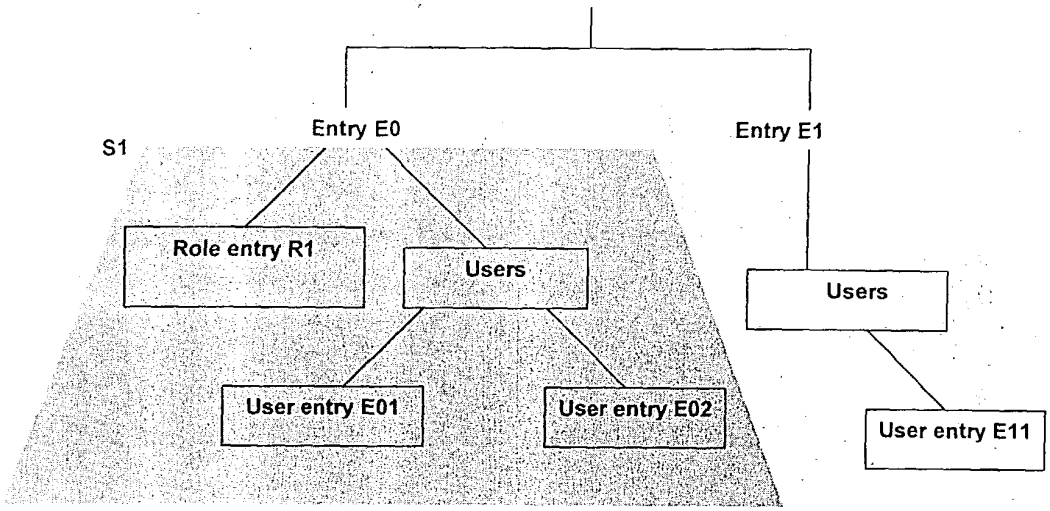
Entry E0
Entry E1
S1
Role entry R1
Users
Users
User entry E01
User entry E02
User entry E11

FIG 7

81 82

Role Type	Object Classes	Attributes
Managed Role (801)	nsSimpleRoleDefinition nsManagedRoleDefinition	description (optional)
Filtered Role (802)	nsComplexRoleDefinition nsFilteredRoleDefinition	NsRoleDN description (optional)
Nested Role (803)	nsComplexRoleDefinition nsNestedRoleDefinition	NsRoleDN description (optional)

Figure 8

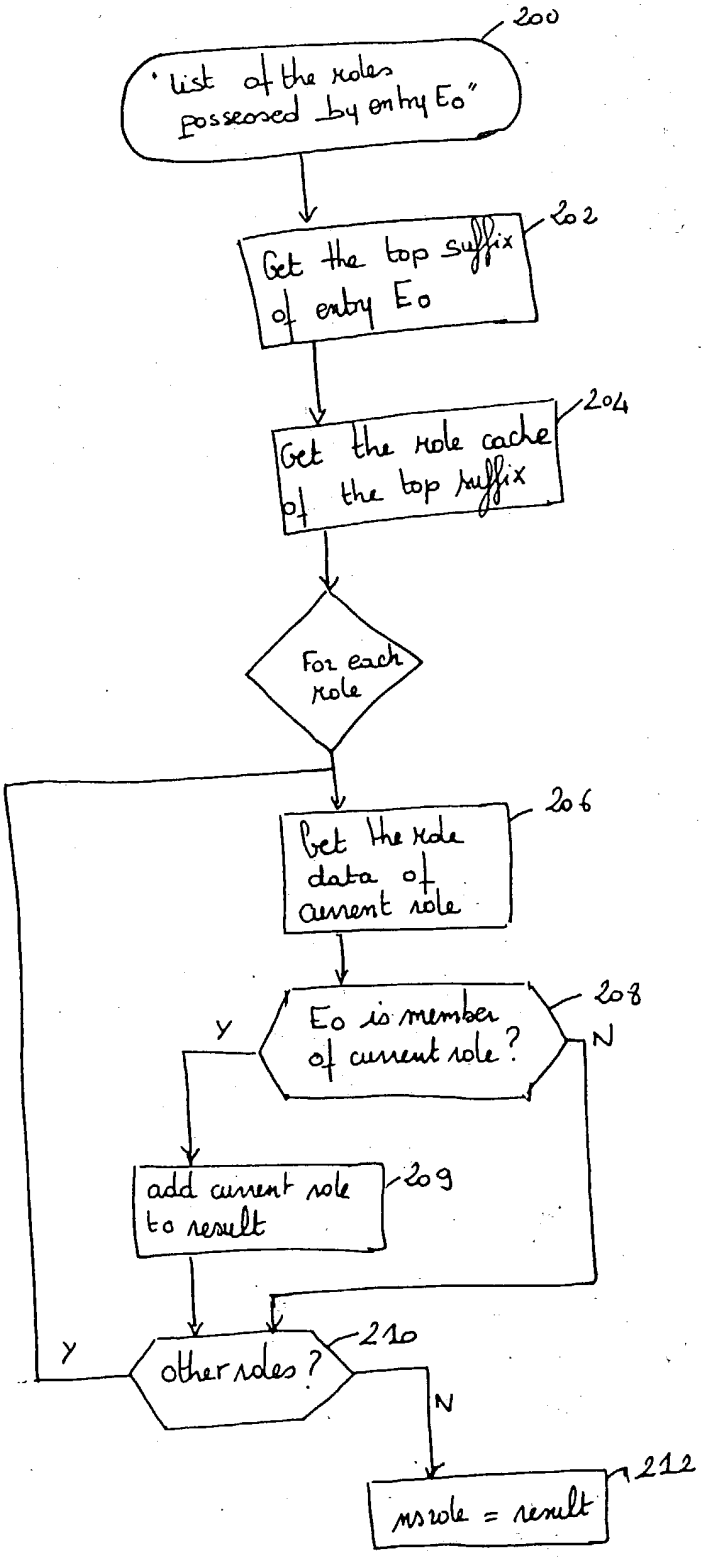
200
"List of the roles possessed by entry Eo"
202
Get the top suffix of entry Eo
204
Get the role cache of the top suffix
For each role
206
Get the role data of current role
208
Eo is member of current role?
Y
N
209
add current role to result
210
other roles?
Y
N
212
msrole = result

FIG 9a

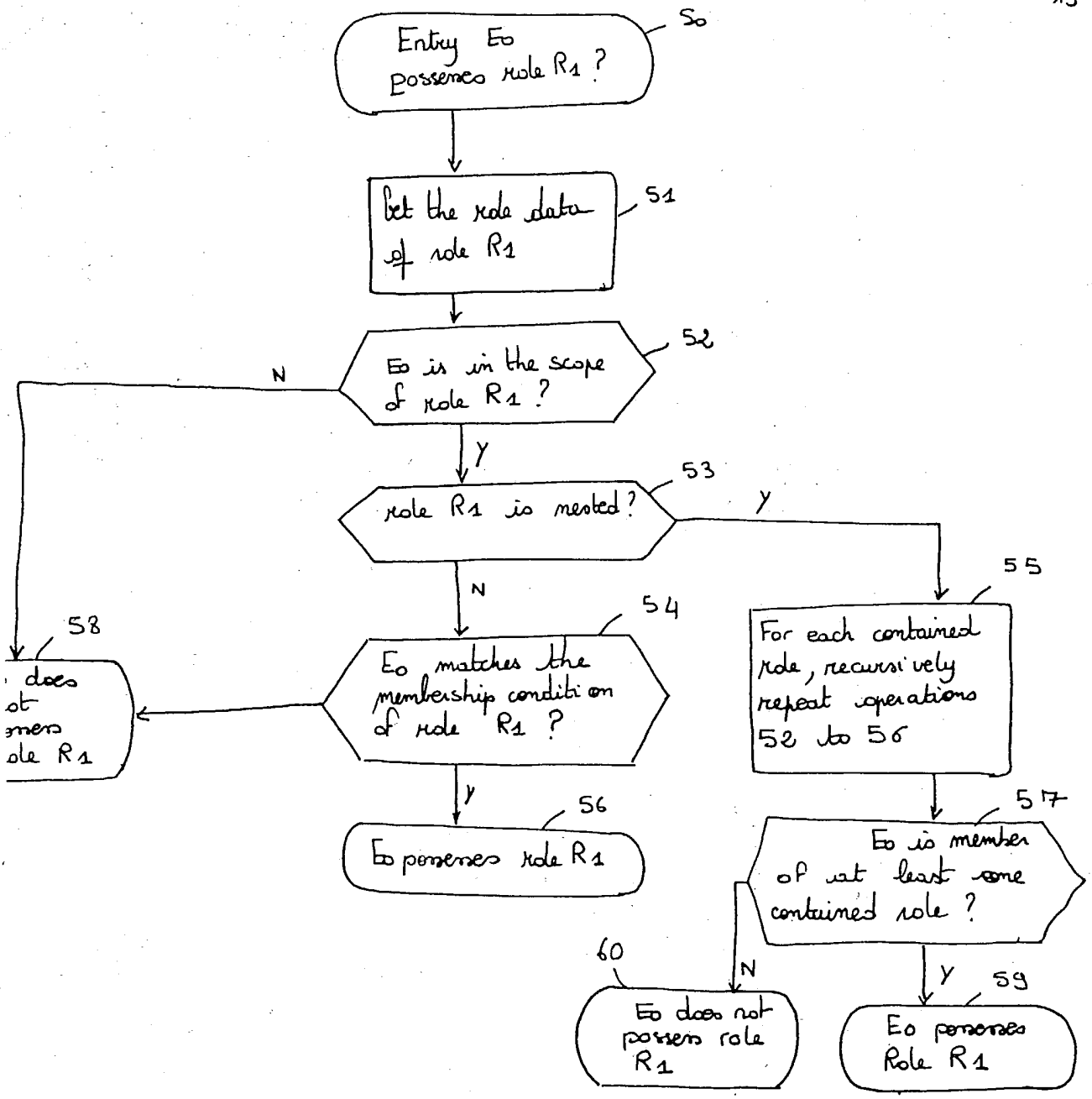
Entity Eo possesses role R1 ?
50
Get the role data of role R1
51
Eo is in the scope of role R1 ?
52
N
Y
role R1 is nested ?
53
Y
N
Eo matches the membership condition of role R1 ?
54
For each contained role, recursively repeat operations 52 to 56
55
does ot ns role R1
58
Eo possesses role R1
56
Eo is member of at least one contained role ?
57
N
Y
Eo does not possess role R1
60
Eo possesses Role R1
59

FIG 9b

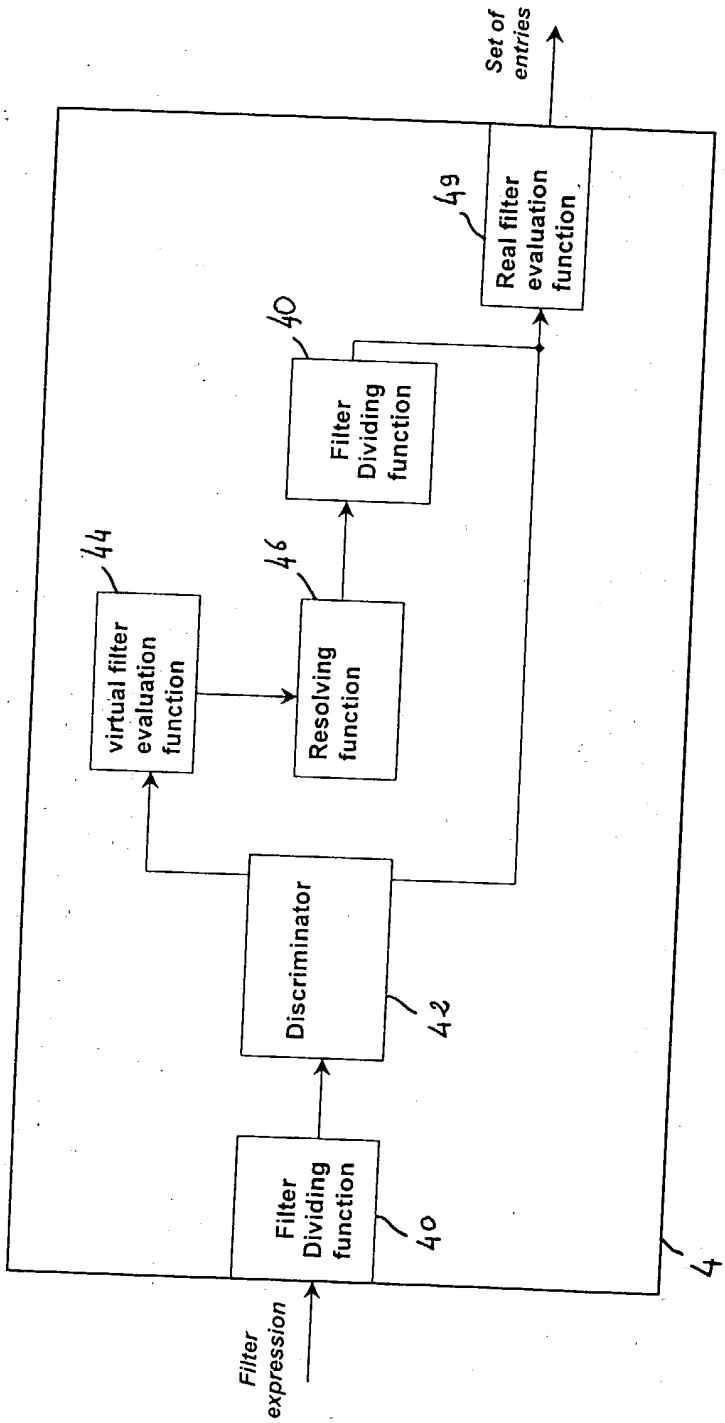
Filter expression
Filter Dividing function
40
Discriminator
42
virtual filter evaluation function
44
Resolving function
46
Filter Dividing function
40
Real filter evaluation function
49
Set of entries
4

Figure 10a

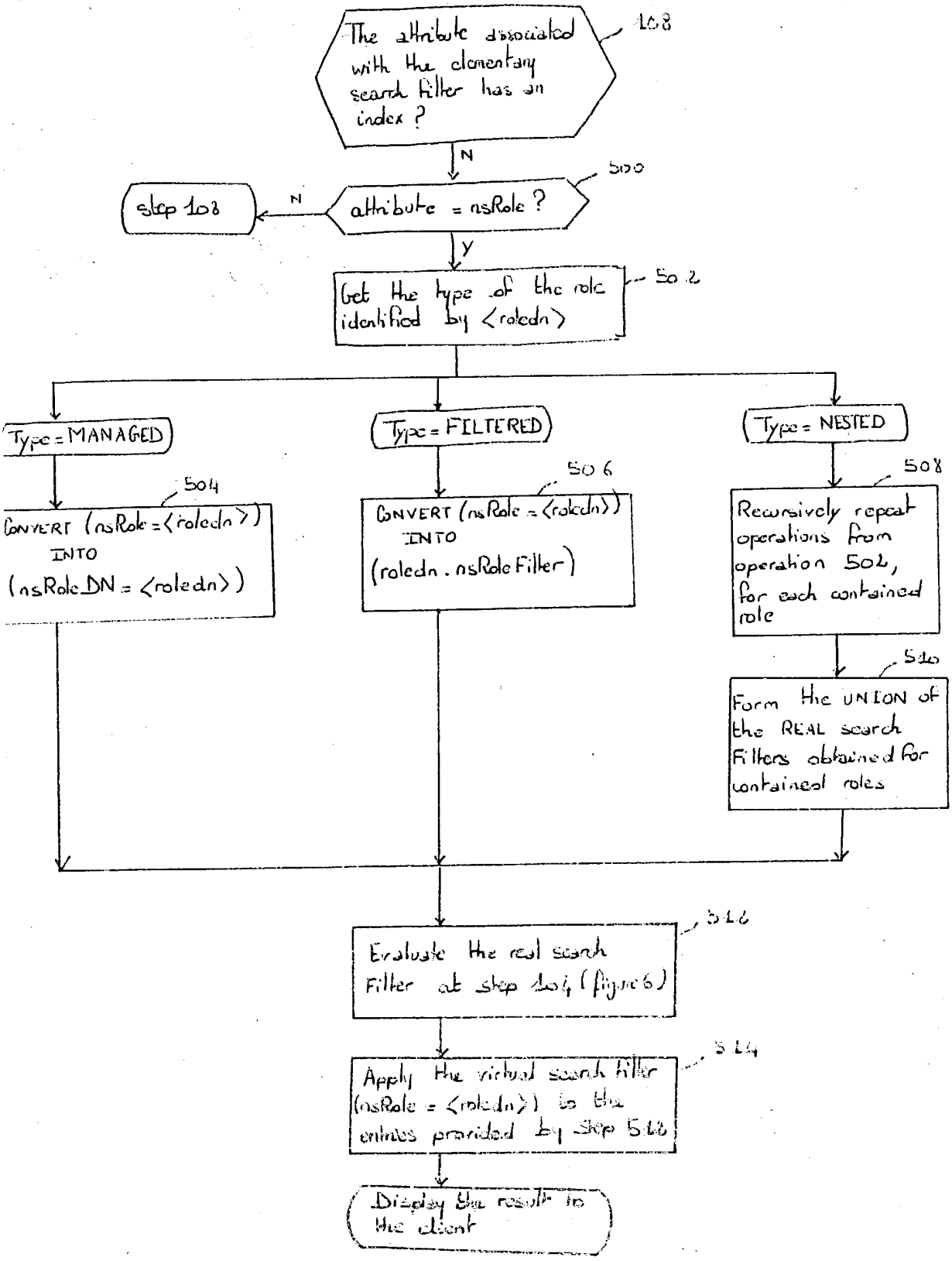
The attribute associated with the elementary search filter has an index ?
108
N
500
attribute = nsRole ?
N
step 108
Y
Get the type of the role identified by <roledn>
502
Type = MANAGED
Type = FILTERED
Type = NESTED
504
CONVERT (nsRole = <roledn>) INTO (nsRoleDN = <roledn>)
506
CONVERT (nsRole = <roledn>) INTO (roledn . nsRoleFilter)
508
Recursively repeat operations from operation 502, for each contained role
510
Form the UNION of the REAL search Filters obtained for contained roles
516
Evaluate the real search Filter at step 104 (figure 6)
514
Apply the virtual search filter (nsRole = <roledn>) to the entries provided by step 516
Display the result to the client

FIG 10b

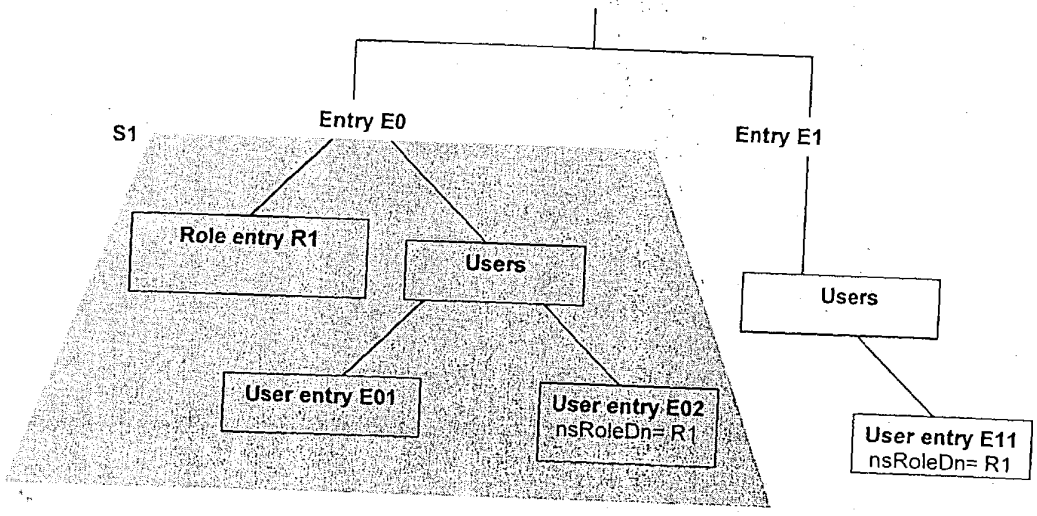
S1
Entry E0
Entry E1
Role entry R1
Users
Users
User entry E01
User entry E02
nsRoleDn= R1
User entry E11
nsRoleDn= R1

FIG. 11